Toward a More Personalized MOOC:
Resources, Activities, and Technologies for MOOC Design and Implementation

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Abstract

This study explores the content, activities, tools, and resources that instructors of massive open online courses (MOOCs) use to enhance the personalization of their MOOC. Email interviews with 25 MOOC and open education leaders about the personalization of MOOCs led to the development of an online survey with both closed and open ended items. The survey was completed by 134 MOOC instructors. There were a range of instructional practices, technology tools, and content resources that instructors employed to personalize MOOC learning environments. Among them were supplemental readings, options on course tasks, and multiple media elements. A majority of respondents reported interest in learning new techniques to personalize their MOOCs and expressed initiative in personalizing their next MOOC offering.

Objectives/Purpose

Massive open online courses (MOOCs) are able to make a global impact by helping learners in developing parts of the world obtain access to education (Jagannathan, 2015). Despite this potential, there are scant empirical studies evaluating how online courses address personalization and cultural sensitivity to meet diverse learner needs. Even fewer studies leverage instructor perspectives to better understand such personalization and cultural sensitivity. In response, this study utilizes mixed methods (Greene, 2007) to explore the practices of 134 experienced MOOC instructors. Using an online questionnaire of MOOC instructors from a wide range of disciplines and locales, it was hoped that this research would help reveal instructional design and delivery practices related to greater personalization and cultural sensitivity within MOOCs. Importantly, the survey items were based on the results of email interviews with more than two dozen experts in MOOCs and open education.

In particular, this study focuses on the following three research questions:

1. What are the personalization practices of MOOC instructors in terms of content resources and associated technology tools employed?
2. What are the personalization practices of MOOC instructors in terms of the task structuring and pedagogical activities employed?
3. How would MOOC instructors structure their MOOC differently next time in terms of MOOC personalization?

Method

According to Kop (2011), instructors are one of the five main components of MOOCs; the other four are learners, topic, material, and context. This study seeks to understand how MOOC instructors are personalizing their courses in an effort to best meet individual student learning needs by using qualitative and quantitative data. The study is comprised of two distinct datasets: (1) two sets of email interviews of 25 international experts in MOOCs and open education; one addressing cultural sensitivity within MOOCs and the other addressing personalization of MOOCs; and (2) an online questionnaire completed by 134 MOOC instructors via SurveyMonkey that focused on the personalization of and cultural sensitivity within their MOOCs (as noted, this paper focuses on the former--personalization). It is important to mention that the email interviews provided the thematic and categorical foundations from which the survey instrument was created.

The 30 item questionnaire consisted of 23 close ended items and seven open ended questions, of which five were optional, narrative responses. Over 1,000 MOOCs were mined from Class Central, the MOOC list, Coursera, edX, FutureLearn, and Open2study to create a database to distribute the questionnaire. Class Central and the MOOC List encompassed proprietary and private platforms, such as Open2study, Canvas, NovoEd, Blackboard, iversity, and Kadenze. Additionally, the researchers directly searched individual vendors and organizational sites to ensure the maximum scope within the MOOC listings database. Next, the researchers cross checked the database for duplicity and errors. The primary selection criteria for MOOC instructor participation in the questionnaire was past or present experience teaching or designing a MOOC.

Results

Some of the findings are recapped below starting with key demographic data related to the instructor experience with MOOCs. For of all, 134 instructors from fields such as science (e.g., computational, biological, and physical), social sciences/humanities (e.g., psychology, theology, and political sciences), engineering, medicine, business, art, and law responded to the online questionnaire (see Figure 1 in appendix). More than half of these instructors had never enrolled in a MOOC as a learner.

In terms of MOOC enrollment, 62 (out of 132) MOOC instructors taught courses with less than 10,000 people, 33 courses had between 10,000-25,000 enrolled, 17 courses had 25,001-50,000, and just eight courses had more than 100,000 enrolled. Such data is in sharp contrast to Jordan (2014) which found an average of 43,000 students for MOOCs.

The instructors were requested to reflect on their practices for their most recent MOOC. Roughly 61% (n=81/132) of the instructors taught instructor led courses; of which 56 instructors utilized additional aids such as teaching assistants, moderators, and/or tutors, while the other 25 instructors had no additional teaching support. Of the remaining 51 courses, 16 were participant driven, 18 were self-paced, eight were hybrid, and nine used other methods.

Given that online course personalization can depend on an instructor's involvement in the course design, participants (n=134) were asked to rank (1-3 Low; 4-7 Medium; and 8-10 High) their involvement in designing the course. Five instructors indicated little involvement in designing the course, while 116 MOOC instructors indicated a high level of involvement, of which 69.8% (81/116) instructors marked "10" out of ten on the scale. Figure 2 (see appendix) represents the self-identified efforts of MOOC instructors during the design and implementation/delivery phases of the MOOC to personalize their courses.

Additionally, MOOC instructors tended to emphasize learner-to-learner interactions with an average of 6.23 on a scale of 1 (low) to 10 (high) (n=121). Table 1 displays the types of ways in which these instructors encouraged their learners to engage in peer-based course interactions; with discussions forums being the most widely technique employed (81.7%).

Another common problem encountered by MOOC instructors is the range of learner prior content mastery and confidence. As identified by Fini (2009), Mackness et al. (2010), McAuley, Stewart, Siemens, and Cormier (2010), and Schulze (2014), MOOC instructors need to account for learner diversity in linguistic, technical, and content competency throughout the course. Table 2 represents the various ways MOOC instructors addressed varying participant competencies and needs. In the open ended questions, instructors indicated that they incorporated "flexible deadlines" (n = 33); allowed learners multiple attempts to compete assignments (n=1); encouraged participants to communicate directly with the instructor (n=4); leveraged social media, multimedia, mobile applications and readings to supplement course materials (n=13); empowered learners to choose their own assignments (n=2) and created student groups (n=2); incorporated guest speakers and/or case-based learning (n=5); and greatly increased the amount of feedback given to students (n=8).

One way to interpret personalization is to consider resources available to MOOC participants. Not surprisingly, MOOC instructors provided discussion forums (91.1%), readings (75%), video lectures and tutorials (74.2%), and practice quizzes (56.5%). They also offered content in the form of expert interviews (50%), interactive assessments (49.2%), PowerPoint and other slides (46%), animations and interactive content (44.4%), instructor lecture notes (42.7%), various forms of visuals like concept maps and flowcharts (43.5%), and video examples like TED talks (41.9%). After that, there is a drop-off to social media (29%), news stories and popular media (29%), wikis (18.5%), podcasts and audio recordings (17.7%), simulations/games (16.9%), job aids or study guides (16.1%), instructor blogs (16.1%), and mobile applications (13.7%). Clearly, there are a wide range of resources that are relied on in a MOOC.

Student choice is a key part of personalization. In this regard, MOOC instructors (n = 111) primarily relied on optional readings (73%) and learner selected incentives such as certificates, badges, or course credit (64%). They also utilized options in terms of course tasks and assignments (40.5%), learner discussion and negotiation of content (36.9%), multiple media elements to explain a concept (33.3%), learner determined or contributed content (30.6%), and learner selected learning pathways (29.8%). Follow-up interviews are needed to explain these options and preferences.

Personalization also requires the awareness of learner progress or learning accomplishments. In terms of student progress in a MOOC, over 40% of MOOC instructors (n=120) relied on learner self-monitoring and evaluation. Furthermore, about one in three (34.2%) employed modular or unit-based forms of assessment. About one in four (24.2%) used moderator, tutor, or teaching assistant feedback. A similar percentage (25.8%) used weekly or daily reports from learning analytics. While about 15.8% used a hybrid system of tracking learner progress and participation, another 15.0% did nothing as learner progress was not monitored.

Most interesting perhaps was that the majority of MOOC instructors surveyed wanted to do a better job of addressing personalization in their next MOOC. There was a wide range of ideas for accomplishing such goals listed the open-ended questions. Respondent ideas included greater instructor participation in discussion forums, increased opportunities for learner reflection, designing online learning communities, shorter and less formal videos, fostering more peer interaction, subtitling content in different languages, and formative assessments in the form of participant surveys at the end of each week.

Discussion and Significance of this Study

As shown in this study, there is no one way to personalize a MOOC. Instructors employed a wide gamut of feedback techniques, pedagogical activities, resources, interactions, and assessments to address learner needs. Such techniques will only increase in the coming years, thereby adding to the already complex instructional task confronting MOOC instructors. It is important to remember that most instructors surveyed in this study had only taught one MOOC. Such limited experiences with MOOCs also constrains the degree to which instructors feel comfortable addressing learner personal needs.

It is clear that there is a pressing need to better understand how MOOCs can become more personalized. This study of over 130 MOOC instructors offers insights how this can be accomplished in both MOOC design and implementation. The results can inform instructional designers, instructors, and policy makers of what is required for higher quality and more effective MOOC experiences. Our expert email interviews and online survey are just the first steps in the process. Follow-up interviews and course observations will further inform those attempting to create more personalized and culturally sensitive experiences. Of course, there is also a need to research learner or participant points of view in terms of MOOC personalization. Better understanding of instructors and participants should help foster more engaging, personalized, and culturally sensitive MOOC-based learning environments.